Claims

1. An arrangement for iterative channel impulse response estimation in a system employing a transmission channel, comprising:

channel impulse response estimation means (310) for producing from a received signal (y) a channel impulse response estimate signal ($\underline{\hat{p}}$); and

noise estimation means (320) for producing from the received signal (y) a noise estimate signal,

characterised in that said noise estimate signal comprises a matrix (W) representing the inverse of noise covariance, and

said channel impulse response estimation means (310) is arranged to iteratively respond to said matrix (W) to iteratively produce an improved channel impulse response estimate signal ($\underline{\hat{p}}$).

2. The arrangement of claim 1 wherein said matrix (W) representing the inverse of noise covariance is calculated at each iteration.

3. The arrangement of claim 1 wherein said matrix (W) representing the inverse of noise covariance is selected from predetermined values corresponding to statistics of expected noise.

4. The arrangement of claim 2 or 3 wherein the channel impulse response estimate signal ($\underline{\hat{p}}$) is represented by:

$$(H^H \cdot W \cdot H)^{-1} \cdot H^H \cdot W \cdot \underline{y},$$

where H represents a matrix depending on known symbols, $\underline{y}$ represents a vector of received channel samples, and W represents the inverse noise covariance matrix.

5. The arrangement of claim 4 when dependent on claim 3 wherein the predetermined values corresponding to statistics of expected noise are selected according to the noise types: Gaussian, upper adjacent interferer, lower adjacent interferer, or co-channel interferer.

6. The arrangement of any preceding claim wherein the channel impulse response estimation means (310) is arranged to produce the channel impulse response estimate signal ($\underline{\hat{p}}$) as a weighted least square function.

7. The arrangement of any preceding claim wherein the system is a wireless communication system.

8. The arrangement of claim 7 wherein the system is a GSM system.

9. The arrangement of claim 8 wherein the system is an EDGE system.

10. A receiver for use in a system employing a transmission channel, the receiver comprising the arrangement of any preceding claim.

11. A method, for iterative channel impulse response estimation in a system employing a transmission channel, comprising:

providing channel impulse response estimation means (310) for producing from a received signal (y) a channel impulse response estimate signal ($\underline{\hat{p}}$); and

providing noise estimation means (320) for producing from the received signal (y) a noise estimate signal,

characterised in that said noise estimate signal comprises a matrix (W) representing the inverse of noise covariance, and

said channel impulse response estimation means (310) iteratively responds to said matrix (W) to iteratively produce an improved channel impulse response estimate signal ($\underline{\hat{p}}$).

12. The method of claim 11 wherein said matrix (W) representing the inverse of noise covariance is calculated at each iteration.

13. The method of claim 11 wherein said matrix (W) representing the inverse of noise covariance is selected from predetermined values corresponding to statistics of expected noise.

14. The method of claim 12 or 13 wherein the channel impulse response estimate signal ($\underline{\hat{p}}$) is represented by:

$$(H^H \cdot W \cdot H)^{-1} \cdot H^H \cdot W \cdot \underline{y},$$

where H represents a matrix depending on known symbols, $\underline{y}$ represents a vector of received channel samples, and W represents the inverse noise covariance matrix.

15. The arrangement of claim 14 when dependent on claim 13 wherein the predetermined values corresponding to statistics of expected noise are selected according to the noise types: Gaussian, upper adjacent interferer, lower adjacent interferer, or co-channel interferer.

16. The method of any one of claims 11 to 15 wherein the channel impulse response estimation means (310) produces the channel impulse response estimate signal($\underline{\hat{p}}$) as a weighted least square function.

17. The method of any one of claims 11 to 16 wherein the system is a wireless communication system.

18. The method of claim 17 wherein the system is a GSM system.

19. The method of claim 18 wherein the system is an EDGE system.

20. A computer program element comprising computer program means for performing the method of any one of claims 11 to 19.